



## Prevalence of hepatitis C virus among blood donors attending general hospital Minna Nigeria

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### Abstract

Persistent Hepatitis C (HCV) infections may develop liver cirrhosis, which is one of the main causes of liver disease. This study was carried out to determine the seroprevalence of Hepatitis C Virus among blood donors in General Hospital Minna Nigeria. Two hundred (200) samples were collected from consented blood donors in the study area and were examined for anti-HCV antibody using a third-generation enzyme-linked immunosorbent assay (ELISA) Test kit (Auto Bio-Diagnostics, China) based on the manufacturer's instructions. Out of 200 samples of voluntary blood donors examined, 2.0% were positive for anti-HCV antibody. Female participants had a higher prevalence of 5.3% than Males who had 2.6%. The age group 20-29 years had the highest seroprevalence of 2.6%, followed by age groups 30-39 with a prevalence of 1.8% while age group 10-19, 40-49 and 50 years and above showed no evidence of HCV antibodies. The seroprevalence of HCV infections among potential blood donors is clear, and this calls for healthcare professionals and policymakers to ensure that proper screening for HCV is conducted in all healthcare facilities in the area prior to any blood transfusion in order to reduce the spread of the infection in the area and across Nigeria.

**Keywords:** hepatitis, virus, prevalence, infection, blood donor, Nigeria

### Introduction

One of the most harmful and potent hepatotropic viruses that infect humans is hepatitis C (HCV). HCV causes liver inflammation, but a long-term infection increases the risk of cirrhosis, hepatocellular cancer (HCC), and liver failure (Kim and Chang, 2013; Han *et al.*, 2019)<sup>[7, 6]</sup>. There are 170 million chronic HCV infected people globally, with an estimated 32 million of them living in Africa, according to WHO (WHO, 2017; Anejo-Okop *et al.*, 2020)<sup>[10, 2]</sup>. In Nigeria, epidemiological information indicates that so far, the prevalence of HCV infection is on the increase, ranging from 4.7-5% in Ilorin, to 5.3-6.6% in Enugu, to 11% in Ibadan and 20% in Benin (Ejiofor *et al.*, 2010)<sup>[5]</sup>. Reports of 400,000 deaths annually brought on by HCV-related liver inflammation confirm the staggering number of mortalities linked to chronic HCV infections (WHO, 2020)<sup>[11]</sup>. HCV is mainly transmitted via exposure to HCV-infected blood and bodily fluids. The neonatal exposure to infected mothers, solid organ transplantations, unprotected sexual contact, and intravenous drug use are risk factors for HCV transmission (WHO, 2020)<sup>[11]</sup>. HCV is an overloading economic burden for the healthcare system, and hence, actual expenditure statistics are monumental. For HCV, around \$300 million is spent on liver transplant every year and the economic burden for infected patient healthcare costs approaches \$9 billion (WHO, 2020)<sup>[11]</sup>. All these reasons make up a powerful stimulus to study and eradicate these viruses. Therefore, this study was designed to determine the seroprevalence rate of HCV among blood donors attending General Hospital Minna Nigeria.

### Materials and methods

#### Background of the Study Area

The study was carried out at Minna, Niger State, Nigeria. It is situated on Latitude 9.61 N and Longitude 6.56 E at an elevation of 299 m above sea level.

It is bordered to the North by Sokoto State, west by Kebbi State, and South by Kogi and South-West by Kwara State. Niger State has a common boundary with the Republic of Benin along New Bussa, Agwara and Wushishi Local Government Area. Samples were collected from General hospitals in Minna Nigeria (GH) shown in (Figure 1).

#### Study Design

The study was a hospital based cross-sectional study. Two hundred (200) Samples were collected randomly from patients in the study populations and examined for presence of disease with regards to the demographic data captured in the structured questionnaire.

#### Study population

The study population focused on male and female blood donors attending Minna General Hospital.

#### Sampling method

A structured questionnaires and consent forms were administered randomly to subjects who gave their consent in order to obtain some demographic data.

#### Collection of samples

Five milliliters (5ml) of blood were collected in an anti-coagulated tube. The plasma was separated and stored in a freezer at -20 until ready for use.

#### Inclusion and Exclusion Criteria

All those that consented, all those within age group 18- 50 years and above within the study population were recruited.

**Assay procedure**

The samples were all screened for antibody to HCV (anti-HCV) using a third generation ELISA

Kit manufactured by Auto Bio-Diagnostics, China. According to the manufacturer, the ELISA kit has a sensitivity of 100.0% and specificity of 99.5%.



**Fig 1:** Map of study area

**Results**

The results showed that out of the 200 samples screened for Hepatitis C Virus antibodies among Blood donors in General Hospital, Minna 4(2.0%) were tested HCV positive. The seroprevalence of HCV antibodies in relation to sex as shown in table 1. The study comprises 181 males and 19 females. Males had prevalence rate of 1.7% HCV positive while Female had prevalence rate of 5.3% HCV positive. The results showed that females had the higher prevalence of 5.3% for HCV as compared to the 1.7% for the male as shown in table 1.

Based on the age group, blood donors within the age group 20-29 constituted the majority of the population screened (57%) while those of age group 50 and above constituted the least (2.5%). Distribution across age group showed that those of age group 20-29 had the highest prevalence rate of 2.6% while age group 30-39 had 1.8 prevalence for HCV infection. The age group of 10-19 and 50 and above recorded zero (0) prevalence rate. The distribution of HCV infections is shown in table 2.

**Table 1:** Percentage distribution of HCV by sex of the blood donors

Sex	No screened	No positive	% Prevalence
Males	181	3	1.7
Females	19	1	5.3
Total	200	4	2.0

**Table 2:** Distribution of HCV by age among blood donors

Age (years)	No. of screened	No. of positive	% Prevalence
10-19	9(4.5)	00	0.0
20-29	114(57.0)	03	2.6
30-39	56(28.0)	01	1.8
40-49	16(8.0)	00	0.0
≥50	5(2.5)	00	0.0
Total	200	04	2.0

**Discussion**

The prevalence of Hepatitis C Virus was determined to be 2.0% among blood donors in General Hospital Minna. This study has a lower prevalence rate than Chukwurah *et al.* (2005) [5] who reported a seroprevalence of 7.6% amongst blood donors at University Teaching Hospital, Enugu,

Southeastern Nigeria; Sheyin *et al.* (2011) [10] reported a seroprevalence of 6.3% among blood donors in Kaduna State, Northwestern Nigeria. Ayolabi *et al.* (2006) [3] reported a sero-prevalence rate of HCV among blood donors in Lagos, Nigeria to be 8.4%, which is also higher than the one observed in the present study (3.4%). The variation in

the seroprevalence of Hepatitis C Virus in this study area and the other studies may be due to differences in socio-cultural, religious beliefs and the sample size used in the various studies from the different parts of the country.

This study showed that females had higher prevalence rate of 5.3% HCV positive than male with prevalence of 1.7% HCV positive. This is in agreement with the findings of Afolabi *et al.* (2012) <sup>[1]</sup> who reported a higher prevalence in females than males in Ibadan, South-western Nigeria. The result obtained in this study reveals that gender did not show any statistical significant association with the seroprevalence of Hepatitis C Virus. This may be attributed to the fact that both the males and females lived in the same area and are involved in virtually the same activities or shared the same facilities that can predisposed them to the infection. This implies that gender differences cannot be used as a determinant for the transmission of the viral infection in the study area.

### Conclusions and recommendations

We conclude from this study that the prevalence of HCV is 2.0%. Additional information on the disease prevalence in Minna, Nigeria, is provided by this study. In order to ascertain the national prevalence, regional prevalence variations, high risk groups, and related risk factors for getting the disease, it is our aim that a thorough assessment of HCV prevalence should also be carried out in Nigeria. This would greatly aid in the formulation of a planned national action plan to stop the spread of the disease and treat individuals who have already contracted it.

### Acknowledgement

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### Competing interests

Authors have declared that no competing interests exist.

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